

C L A I M S

1. A fracture fixation system comprising a buttress member adapted for fracture fixation and a fixation washer for securing the buttress member to a stable bone fragment on one side of a bone fracture, said buttress member comprising a wire element having a U-shaped bend with opposite legs extending from the U-shaped bend, said legs having distal ends with portions bent away from the legs and adapted for buttressing a surface of an unstable bone fragment on an opposite side of the fracture, said fixation washer comprising a body for lying on the wire element and including a plurality of tabs projecting from said body for engaging said legs, said body having a hole for passage therethrough of a bone screw adapted to secure the washer and the underlying wire element to said stable bone fragment, and means on said body of the washer for applying a counter-bearing pressure on one of the legs of the wire element to oppose rotation of the washer when the bone screw is turned for engagement in the stable fragment.

2. The fracture fixation system of claim 1, wherein said means for applying counter-bearing pressure to oppose rotation of the washer comprises a further tab on said washer, said plurality of tabs engaging the legs of the wire element on one side of said legs and said further tab engaging said one leg of the wire element on an opposite side of said one leg.

3. The fracture fixation system of claim 2, wherein said further tab and said plurality of tabs are arranged to provide a snap-engagement of said tabs with said legs of the wire element.

4. The fracture fixation system of claim 1, wherein said washer includes a projection extending lengthwise between the legs of the wire element, said projection having a second hole for passage therethrough of a fixation element adapted to penetrate into said one bone fragment.

5. The fracture fixation system of claim 4, wherein said fixation element and said bent portions at said distal ends of said legs of the wire element extend at an angle relative to one another.

6. A fracture fixation system comprising a buttress member adapted for fracture fixation and a fixation washer for securing the buttress member to a stable bone fragment on one side of a bone fracture, said buttress member comprising a wire element having a U-shaped bend with opposite legs extending from the U-shaped bend, said legs having distal ends with portions bent away from the legs and adapted for buttressing a surface of an unstable bone fragment on an opposite side of the fracture, said fixation washer comprising a body for lying on the wire element and including a plurality of tabs projecting from said body for engaging said legs, said body having a hole for passage therethrough of a bone screw adapted to secure the washer and the underlying wire element to said stable bone fragment, said legs of said wire element being spaced from one another and having a reduced spacing at said U-shaped bend as compared to the spacing of the legs at the distal ends thereof.

7. The fracture fixation system of claim 6, wherein said legs are of equal length.

8. The fracture fixation system of claim 6, wherein said legs are of unequal length.
9. The fracture fixation system of claim 6, wherein the bent portions at the distal ends of the legs are unequal in length.
10. The fracture fixation system of claim 6, wherein said legs have a length from the U-shaped bend to said distal ends which are unequal.
11. The fracture fixation system of claim 6, wherein one of said legs of the wire element is straight and the other leg has a bend therein to define first and second portions in which the legs are parallel and spaced apart and wherein the spacing between the legs in the first portion is less than the spacing between the legs in the second portion.
12. A fracture fixation system comprising a buttress member adapted for fracture fixation and a fixation washer for securing the buttress member to a first bone fragment on one side of a bone fracture, said buttress member comprising a wire element having a U-shaped bend with opposite legs extending from the U-shaped bend, said legs having distal ends with portions bent away from the legs and adapted for buttressing a surface of a second bone fragment on an opposite side of the fracture, said fixation washer comprising a body for lying on the wire element and including a plurality of tabs projecting from said body for engaging said legs, said body having a hole for passage therethrough of a bone screw adapted to secure the washer and the underlying wire element to said first bone fragment, and means on said body of the washer for applying a counter-bearing pressure on one of the legs of the

wire element to oppose rotation of the washer when the bone screw is turned for engagement in the first bone fragment, said legs of said wire element being spaced from one another and having a reduced spacing at said U-shaped bend as compared to the spacing of the legs of the wire element at the distal ends thereof.

13. A fixation washer for securing a wire form to a bone, said fixation washer comprising a body having side edges extending to opposite sides of the wire form, a plurality of tabs extending from said body for engaging the opposite sides of said wire form, said body having a hole between said side edges for passage therethrough of a bone screw adapted to secure the washer to the bone and a further tab on said body at a position for engaging the wire form in counter-bearing opposition to at least one of said plurality of tabs to prevent rotation of the washer as the bone screw is turned for engagement in the bone.

14. The fixation washer of claim 13, wherein said further tab is constructed and arranged relative to said at least one of said plurality of tabs to snap-engage the wire form and be resiliently secured therewith.

15. The fixation washer of claim 14, wherein said further tab is inclined relative to said at least one of said plurality of tabs.

16. The fixation washer of claim 15, wherein said further tab is bendable to adapt inclination thereof relative to said at least one of said plurality of tabs.

17. The fixation washer of claim 15, wherein said at least one of said plurality of tabs comprise two tabs which are spaced apart from one another, said further tab being disposed at a position between said two tabs.

18. The fixation washer of claim 16, wherein all of said tabs are bent from said body.

19. The fixation washer of claim 18, wherein two of said tabs are disposed at each of said side edges of said body.

20. The fixation washer of claim 15, wherein at least some of said tabs are curved to fit the opposite sides of the wire form.

21. The fixation washer of claim 15, wherein said tabs are bendable to conform to said opposite sides of said wire form.

22. The fixation washer of claim 13, wherein said body includes a second said hole for a second bone screw.

23. The fixation washer of claim 13, wherein said body has a width such that said plurality of tabs are adapted to engage wire elements of two wire forms adjacent to one another.

24. The fixation washer of claim 13, wherein said body is made of metal.

25 The fixation washer of claim 13, wherein said body is made of plastic.

26. The fixation washer of claim 13, wherein said body includes a projection at an end edge of the body, said projection having a second hole for insertion therein of a fixation element adapted for penetrating a bone fragment of the bone.

27. A fracture fixation system comprising a buttress member adapted for fracture fixation and a fixation washer for securing the buttress member to a stable bone fragment on one side of a bone fracture, said buttress member comprising a wire element having a U-shaped bend with opposite legs extending from the U-shaped bend, said legs having distal ends with portions bent away from the legs and adapted for buttressing a surface of an unstable bone fragment on an opposite side of the fracture, said fixation washer comprising a body for lying on the wire element, said body having a hole for passage therethrough of a bone screw adapted to secure the washer and the underlying wire element to said stable bone fragment, said body having a second hole adapted for insertion of a fixation element adapted for being secured to the unstable bone fragment.

28. The fracture fixation system of claim 27, wherein said fixation element comprises a screw adapted for insertion into the unstable fragment of the bone.

29. The fracture fixation system of claim 27, wherein said fixation element

comprises a post adapted for threaded engagement in the unstable fragment of the bone.

30. The fracture fixation system of claim 29, wherein said post has a threaded head and said second hole is threaded for threaded engagement by said threaded head of the post.

31. The fracture fixation system of claim 29, wherein said fixation element includes a portion adapted for buttressing the unstable bone fragment at an articulate surface thereof, said portions of the legs being adapted for buttressing the articulate surface, said portion of the fixation element and said portions of the legs extending at different angles with respect to the articulate surface.

32. The fracture fixation system of claim 31, wherein said portion of the fixation element and said portions of the wire elements extend in opposite directions of inclination.

33. The fracture fixation system of claim 27, wherein said second hole extends obliquely in said body of the washer.

34. The fracture fixation system of claim 27, wherein said fixation element is secured in said body by an expandible bearing in said second hole.

35. The fracture fixation system of claim 27, said second hole is located in a projection for guiding said fixation element for buttressing the articulate portion of the bone fragment.

36. The fracture fixation system of claim 35, wherein the second hole causes the fixation element to be angularly offset with respect to the buttressing portions of the legs of the wire element.

37. The fracture fixation system of claim 36, wherein the angular offset of the fixation element and the buttressing portions of the wire element are adapted to produce separate contact regions with the articulate portion of the bone fragment.

38. An offset volar buttress pin comprising a wire element having a U-shaped bend with opposite legs extending from the U-shaped bend, said opposite legs having distal ends at which the legs are bent away for buttressing a surface of the bone, said legs being spaced apart in first region in proximity to said U-shaped bend at a distance which is less than the spacing of the legs in a second region in proximity to said distal ends.

39. The offset volar buttress pin of claim 38, wherein the legs extend parallel to one another in said first and second regions.

40. The offset volar buttress pin of claim 39, wherein one of said legs is bent outwardly in a direction away from the other of the legs to form a step separating the first and second regions.

41. The offset volar buttress pin of claim 38, wherein said legs are of equal length.

42. The offset volar buttress pin of claim 38, wherein said legs are of unequal length.

43. The offset volar buttress pin of claim 38, wherein the bent portions at the distal ends of the legs are unequal in length.

44. The offset volar buttress pin of claim 38, wherein said legs have a length from the U-shaped bend to said distal ends which are unequal.

45. The offset volar buttress pin of claim 38, wherein one of said legs of the wire element is straight and the other leg has a bend therein to define first and second portions in which the legs are parallel and spaced apart and wherein the spacing between the legs in the first portion is less than the spacing between the legs in the second portion.

46. A method of installing a volar buttress pin on a fractured radius bone, said method comprising:

providing a volar buttress pin formed from a wire element having a U-shaped bend with opposed legs extending from said U-shaped bend and terminating at a distal end of the buttress pin with out of plane bent ends,

placing the volar buttress pin on a fractured radius bone so that said bent ends of the buttress pin penetrate into an unstable fragment of the bone,

engaging a washer on the legs of the buttress pin such that the washer engages at least one of the legs of the buttress pin at opposite sides thereof thereby preventing the washer

from rotating in its plane while permitting sliding movement of the washer along the legs of the buttress pin,

securing the washer to a stable bone fragment with a bone screw to secure the washer and the buttress pin to the stable bone fragment, the engagement of the washer with said at least one leg of the buttress pin preventing relative rotation of the washer with respect to said buttress pin as the bone screw is turned to be threaded into the stable bone fragment,

said washer being provided with a projection at a distal end thereof, and

securing the washer to the unstable bone fragment by inserting a fixation element through said projection at the distal end of the washer into said unstable bone fragment.

47. The method of claim 46, wherein said fixation element is loosely fitted in a hole in said projection of said washer to enable angular variation of the fixation element prior to its engagement in the unstable bone fragment.

48. The method of claim 47, comprising providing a rotatable bearing in the hole in the projection one the washer to enable the fixation element to be angularly moved in the hole in said projection.

49. The method of claim 47, comprising threadably engaging the fixation element in the bearing as the fixation element is inserted into the unstable bone fragment.

50. The method of claim 46, comprising securing the buttress pin to the stable bone fragment with an additional washer located more proximal to the U-shaped bend portion of

the buttress pin and securing the additional washer to the stable bone fragment into a further bone screw.

51. The method of claim 50, wherein the legs of the buttress pin are spaced apart at a distance where the legs are engaged by said further washer, which is less than the spacing of the legs where they are engaged by the first said washer.

52. The method of claim 46, wherein the fixation element is inserted into the unstable bone fragment at an angle relative to said bent ends of the buttress pin to cause said fixation element and said bent ends to brace the unstable bone fragment at different points of contact.

53. The method of claim 46, wherein the washer is formed for engaging both of the legs of the buttress pin at respective opposite sides thereof to oppose rotation of the washer in its plane relative to said buttress pin.